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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/018,517	08/19/2002	Weiquan Liu	42390.P9659	2647
7590	06/05/2007			
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ART UNIT	PAPER NUMBER			
2626				
MAIL DATE	DELIVERY MODE			
06/05/2007 PAPER				

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/018,517	LIU ET AL.	
	Examiner	Art Unit	
	James S. Wozniak	2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 12 March 2007.
 2a) This action is FINAL. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1,2,4-8,10-14 and 16-18 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) Claim(s) _____ is/are allowed.
 6) Claim(s) 1,2,4-8,10-14 and 16-18 is/are rejected.
 7) Claim(s) _____ is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on 19 August 2002 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892) 4) Interview Summary (PTO-413)
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948) Paper No(s)/Mail Date. _____.
 3) Information Disclosure Statement(s) (PTO/SB/08)
 Paper No(s)/Mail Date _____ 5) Notice of Informal Patent Application
 _____. 6) Other: _____

DETAILED ACTION

Response to Amendment

1. In response to the office action from 12/11/2006, the applicants have submitted a request for continued examination, filed 3/12/2007, amending independent claims 1, 7, and 13, while arguing to traverse the art rejection based on the limitation regarding counting matching features in each paragraph, ranking and selecting paragraphs based on the count, aggregating the selected paragraphs into a summary (*Amendment, Page 8*). The applicant's arguments have been fully considered but are moot with respect to the new grounds of rejection further in view of Salton et al ("Automatic Text Structuring and Summarization," 1997).

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. **Claims 7-8 and 10-12** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The specification does not disclose the term "tangible machine readable

medium.” Although the specification lists various types of machine-readable mediums that can be considered “tangible” (*Pages 8-9*), the specification does not use the word “tangible” to describe them. Thus claims 7-8 and 10-12 fail to comply with the written description requirement.

Claim Rejections - 35 USC § 101

4. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. **Claims 1-2, 4-8, 10-14, and 16-18** are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claim 7 is drawn to an “instructions” data structure *per se*, stored on a “machine” readable medium and executable by a “processor”, as recited in the preamble and as such is non-statutory subject matter. See MPEP § 2106.IV.B.1.a.

Data structures not claimed as embodied in computer readable media are descriptive material *per se* and are not statutory because they are not capable of causing functional change in a computer. See, e.g., *Warmerdam*, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure *per se* held nonstatutory). Such claimed data structures do not define any structural and functional interrelationships between the data structure and other claimed aspects of the invention, which permit the data structure's functionality to be realized. In contrast, a claimed computer readable medium encoded with a data structure defines structural and functional

interrelationships between the data structure and the computer software and hardware components which permit the data structure's functionality to be realized, and is thus statutory.

Also, in order for a claimed invention to be considered statutory under 35 U.S.C. 101, it must be useful and accomplish a practical application. That is, it must produce a "useful, concrete and tangible result" (*State Street, 149 F.3d at 1373-74, 47 USPQ2d at 1601-02*). In the present case, the final result of Claims 1, 7, and 13 only refers to aggregated summary within a processor and not a tangible output of the summary (*for example- summary display, storage to memory, etc.*). As such, claim 1, 7, and 13 are directed to non-statutory subject matter. The dependent claims fail to overcome the 35 U.S.C. 101 rejection directed towards independent claims 1, 7, and 13, and thus, are also directed to non-statutory subject matter.

Although the process in **claim 1** is directed to a seemingly patentable process, featuring summary processing algorithm steps identical to those recited in claim 7, this claim is directed towards non-functional descriptive material (i.e., data structure description) by virtue of Claim 7. Claim 7 indicates that these steps are part of machine instructions. In claim 1, this data structure is not stored on a computer readable medium that enables the data structure's functionality to be realized when executed by a computer to achieve a "useful, concrete, and tangible result" (*see above*). Thus, claim 1 is directed to non-statutory subject matter, for the same reasons as claim 7.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. **Claims 1 and 5-6** are rejected under 35 U.S.C. 103(a) as being unpatentable over McKeown et al (*"Towards Multidocument Summarization by Reformulation: Progress and Prospects,"* 1999) in view of Salton et al (*"Automatic Text Structuring and Summarization,"* 1997).

With respect to **Claim 1**, McKeown discloses:

Parsing a plurality of paragraphs in a plurality of documents, each document with one or more of the paragraphs (*breaking a set of documents into paragraph text units, Page 454, System Architecture; and Fig. 2*);

Selecting paragraphs from the documents through a subsuming relation calculation (*determining paragraph similarity based on matching terms and relationships for paragraph selection in theme determination, Page 454, Identifying themes*), wherein the subsuming relation calculation includes:

Linking noun phrases, verb phrases or entity names in each paragraph of every document with identical noun phrases, verb phrases or entity names in every other paragraph of every document (*word co-occurrence and noun phrase matching used in a similarity calculation, Pages 455-456, Document Analysis*); and

Counting the links for each paragraph (*determining the amount of matching terms for each paragraph unit, Page 455, System Architecture; and Page 456, Document Analysis*), denoting the number of links as the significant score of that paragraph (*measuring paragraph pairwise similarity based upon matching term occurrence frequency, Page 456, Document Analysis*).

Although McKeown discloses a method for multi-document summarization utilizing links between paragraphs and a count based upon linking term occurrence frequency within the paragraphs, McKeown does not specifically teach counting created links for paragraph selection and aggregation for creating a summary. Such summary formation techniques are well known in the text processing art, however, as is evidenced by the Salton reference. Salton discloses counting and recording the term links in a paragraph node to other paragraphs, selecting the top-ranking targeted number of paragraphs based on the number of links, and extracting the top ranking paragraphs to create a summary (*Sections 3-3.1, Page 198*).

McKeown and Salton are analogous art because they are from a similar field of endeavor in text summarization. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of McKeown with the text summarization technique taught by Salton in order to provide a means for creating a comprehensive summary having good coverage of a particular subject matter (*Salton, Section 3.1, Page 198*).

With respect to **Claim 5**, McKeown further discloses:

The documents have a common topic independent of domain (*summarizing multiple documents in any domain, Page 459, Conclusions and Future Work*).

With respect to **Claim 6**, McKeown further recites the summarization of English documents (*see Fig. 2*).

8. **Claim 2** is rejected under 35 U.S.C. 103(a) as being unpatentable over McKeown et al (“*Towards Multidocument Summarization by Reformulation: Progress and Prospects*,” 1999) in view of Salton et al in view of McKeown et al (*U.S. Patent: 6,473,730*) and further in view of Ueda (*U.S. Patent: 6,493,663*).

With respect to **Claim 2**, McKeown in view of Salton discloses the multiple document summarization method and system featuring noun phrase extraction as applied to Claim 1. McKeown in view of Salton does not specifically suggest a means for categorizing noun phrases that are entity names and converting the entity names into canonical form, however McKeown (*U.S. Patent: 6,473,730*) recites:

Categorizing the noun phrases that are entity names (*identified proper noun phrases relating to an entity*, Col. 3, Line 62- Col. 4, Line 15; and Col. 5, Line 41-57); and

Converting the entity names into canonical form (*Col. 5, Lines 7-20*).

McKeown (“*Towards Multidocument Summarization by Reformulation: Progress and Prospects*,” 1999), Salton, and McKeown (*U.S. Patent: 6,473,730*) are analogous art because they are from a similar field of endeavor in document summarization. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of McKeown (“*Towards Multidocument Summarization by Reformulation: Progress and Prospects*,” 1999) in view of Salton with the parsing algorithms taught by McKeown (*U.S.*

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Patent: 6,473,730) in order to implement a further means for identifying significant topical segments (McKeown, Col. 2, Lines 35-37).

McKeown ("Towards Multidocument Summarization by Reformulation: Progress and Prospects," 1999), Salton, and McKeown (U.S. Patent: 6,473,730) do not specifically suggest the extraction of verb phrases, however Ueda discloses the extraction of such phrases (Col. 20, Line 65- Col. 21, Line 4).

McKeown ("Towards Multidocument Summarization by Reformulation: Progress and Prospects," 1999), Salton, McKeown (U.S. Patent: 6,473,730), and Ueda are analogous art because they are from a similar field of endeavor in document summarization. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of McKeown ("Towards Multidocument Summarization by Reformulation: Progress and Prospects," 1999) in view of Salton and further in view of McKeown (U.S. Patent: 6,473,730) with the verb phrase extraction taught by Ueda in order to include additional well-known phrase types so that a user can select an appropriate summarization style (Ueda, Col. 21, Lines 1-4).

9. **Claim 4** is rejected under 35 U.S.C. 103(a) as being unpatentable over McKeown et al ("Towards Multidocument Summarization by Reformulation: Progress and Prospects," 1999) in view of Salton et al and further in view of McKeown et al (U.S. Patent: 6,473,730).

With respect to **Claim 4**, McKeown in view of Salton discloses the multiple document summarization method and system as applied to Claim 1. McKeown in view of Salton does not specifically suggest a means for applying a co-reference resolution algorithm and replacing

pronouns with full entity name antecedents, however McKeown (*U.S. Patent: 6,473,730*)

recites:

Applying a co-reference resolution algorithm to the paragraphs (*linking noun phrases to a head noun phrase- see “red wine” example, Col. 5, Lines 7-20*); and

Replacing pronouns in the paragraphs with their full entity name antecedents (*merging pronouns and proper noun phrase processing, Col. 5, Lines 7-57*).

McKeown (“*Towards Multidocument Summarization by Reformulation: Progress and Prospects,*” 1999), Salton, and McKeown (*U.S. Patent: 6,473,730*) are analogous art because they are from a similar field of endeavor in document summarization. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of McKeown (“*Towards Multidocument Summarization by Reformulation: Progress and Prospects,*” 1999) in view of Salton with the rewriting algorithms taught by McKeown (*U.S. Patent: 6,473,730*) in order to implement a further means for identifying significant topical segments (*McKeown, Col. 2, Lines 35-37*).

10. **Claims 7, 11-13, and 17-18** are rejected under 35 U.S.C. 103(a) as being unpatentable over McKeown et al (“*Towards Multidocument Summarization by Reformulation: Progress and Prospects,*” 1999) in view of Salton et al and further in view of Ueda (*U.S. Patent: 6,493,663*).

With respect to **Claims 7 and 13**, McKeown in view of Salton discloses the multiple document summarization method and system as applied to Claim 1. McKeown in view of Salton does not specifically suggest method implementation as a program stored on a computer readable medium or associated processing elements, however Ueda discloses summarizing method

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implementation as a program stored on a computer readable medium (*Col. 3, Lines 20-24*). Ueda also recites method implementation using a computer processor that would inherently require a bus for communicating with the disclosed computer memory medium to achieve document summarization processing (*Col. 23, Lines 29-44*).

McKeown, Salton, and Ueda are analogous art because they are from a similar field of endeavor in document summarization. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of McKeown in view of Salton with the computer program implementations taught by Ueda in order to provide a means for easily implementing a document summarization method on any type of computer (*Ueda, Col. 3, Lines 20-24*).

With respect to **Claims 11 and 17**, McKeown discloses:

The documents have a common topic independent of domain (*summarizing multiple documents in any domain, Page 459, Conclusions and Future Work*).

With respect to **Claims 12 and 18**, McKeown recites the summarization of English documents (*see Fig. 2*).

11. **Claims 8, 10, 14, and 16** are rejected under 35 U.S.C. 103(a) as being unpatentable over McKeown et al ("Towards Multidocument Summarization by Reformulation: Progress and Prospects," 1999) in view of Salton in view of Ueda (*U.S. Patent: 6,493,663*) and further in view of McKeown et al (*U.S. Patent: 6,473,730*).

With respect to **Claims 8 and 14**, McKeown in view of Salton and further in view of Ueda discloses the multiple document summarization method and system featuring noun phrase

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extraction as applied to Claims 7 and 13. Ueda also discloses the extraction of verb phrases (*Col. 20, Line 65- Col. 21, Line 4*). McKeown in view of Salton and further in view of Ueda does not specifically suggest a means for categorizing noun phrases that are entity names and converting the entity names into canonical form, however McKeown (*U.S. Patent: 6,473,730*) recites:

Categorizing the noun phrases that are entity names (*identified proper noun phrases relating to an entity*, *Col. 3, Line 62- Col. 4, Line 15; and Col. 5, Line 41-57*); and

Converting the entity names into canonical form (*Col. 5, Lines 7-20*).

McKeown ("Towards Multidocument Summarization by Reformulation: Progress and Prospects," 1999), Salton, Ueda, and McKeown (*U.S. Patent: 6,473,730*) are analogous art because they are from a similar field of endeavor in document summarization. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of McKeown ("Towards Multidocument Summarization by Reformulation: Progress and Prospects," 1999) in view of Salton and further in view of Ueda with the parsing algorithms taught by McKeown (*U.S. Patent: 6,473,730*) in order to implement a further means for identifying significant topical segments (*McKeown, Col. 2, Lines 35-37*).

With respect to **Claims 10 and 16**, McKeown (*U.S. Patent: 6,473,730*) further discloses:

Applying a co-reference resolution algorithm to the paragraphs (*linking noun phrases to a head noun phrase- see "red wine" example, Col. 5, Lines 7-20*); and

Replacing pronouns in the paragraphs with their full entity name antecedents (*merging pronouns and proper noun phrase processing, Col. 5, Lines 7-57*).

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Johnson et al (*U.S. Patent: 7,162,413*)- discloses a method for summarizing a class of documents in a document collection.

Mitra et al ("Automatic Text Summarization by Paragraph Extraction," 1997)- discloses a method for creating a text summary using a plurality of extracted paragraphs.

Radev et al ("Generating Natural Language Summaries from Multiple On-Line Sources," 1998)- discloses a method for summarizing multiple documents.

Hatzivassiloglou et al ("Detecting Text Similarity over Short Passages: Exploring Linguistic Feature Combinations via Machine Learning," 1999)- discloses a method for document summarization that measures the similarity between textual units by counting the number of matching features.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James S. Wozniak whose telephone number is (571) 272-7632. The examiner can normally be reached on M-Th, 7:30-5:00, F, 7:30-4, Off Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard can be reached at (571) 272-7603. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

James S. Wozniak
5/10/2007


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